FIG.1

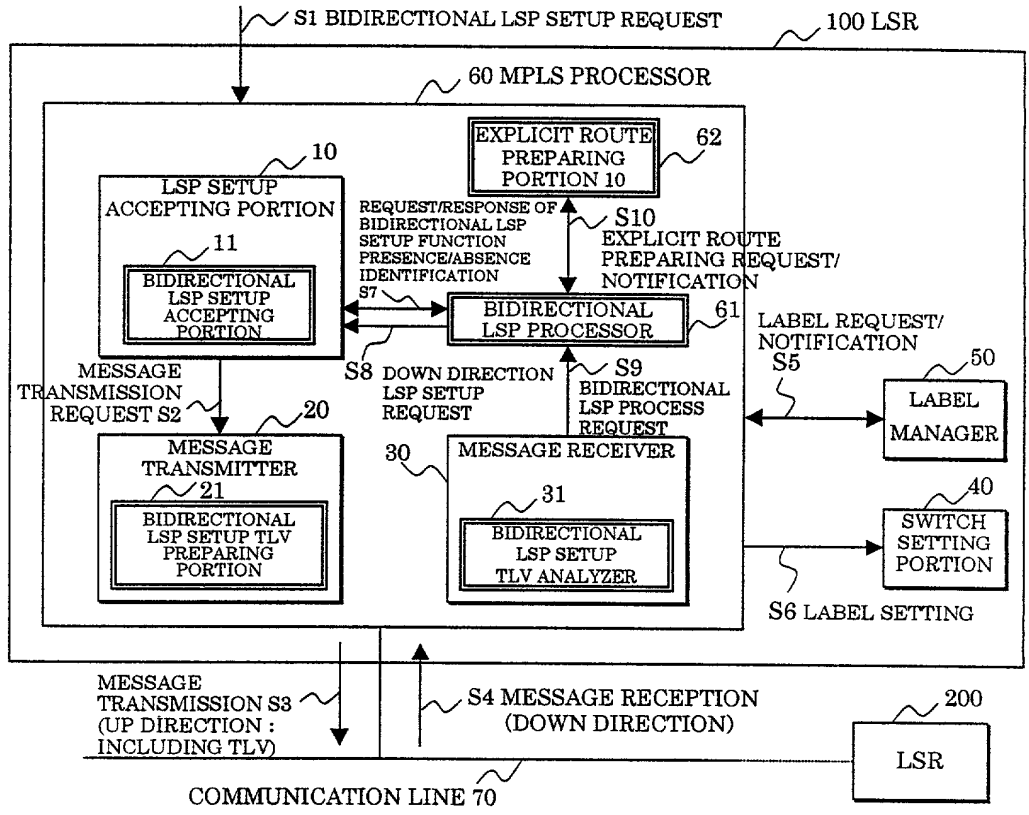
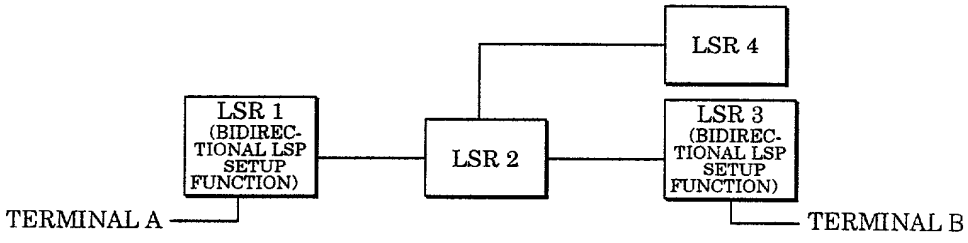

S1 BIDIRECTIONAL LSP SETUP REQUEST
100 LSR
60 MPLS PROCESSOR
EXPLICIT ROUTE PREPARING PORTION 10
62
10
LSP SETUP ACCEPTING PORTION
11
BIDIRECTIONAL LSP SETUP ACCEPTING PORTION
REQUEST/RESPONSE OF BIDIRECTIONAL LSP SETUP FUNCTION PRESENCE/ABSENCE IDENTIFICATION
S7
S10
EXPLICIT ROUTE PREPARING REQUEST/ NOTIFICATION
BIDIRECTIONAL LSP PROCESSOR
61
LABEL REQUEST/ NOTIFICATION
S5
50
LABEL MANAGER
MESSAGE TRANSMISSION REQUEST S2
20
S8 DOWN DIRECTION LSP SETUP REQUEST
S9
BIDIRECTIONAL LSP PROCESS REQUEST
MESSAGE TRANSMITTER
21
BIDIRECTIONAL LSP SETUP TLV PREPARING PORTION
30
MESSAGE RECEIVER
31
BIDIRECTIONAL LSP SETUP TLV ANALYZER
40
SWITCH SETTING PORTION
S6 LABEL SETTING
MESSAGE TRANSMISSION S3 (UP DIRECTION : INCLUDING TLV)
S4 MESSAGE RECEPTION (DOWN DIRECTION)
200
LSR
COMMUNICATION LINE 70

FIG.2


LSR 4
LSR 1 (BIDIRECTIONAL LSP SETUP FUNCTION)
LSR 2
LSR 3 (BIDIRECTIONAL LSP SETUP FUNCTION)
TERMINAL A
TERMINAL B

FG72 (2)

FIG.3

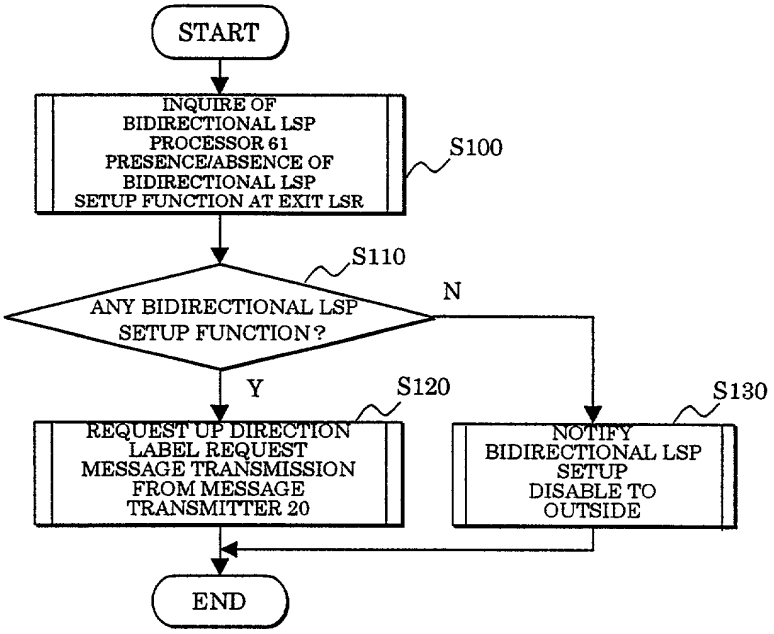


FIG.4

TABLE FOR LSR WITHOUT BIDIRECTIONAL LSP SETUP FUNCTION
LSR 2
LSR 4

FG72 (3)

FIG.5

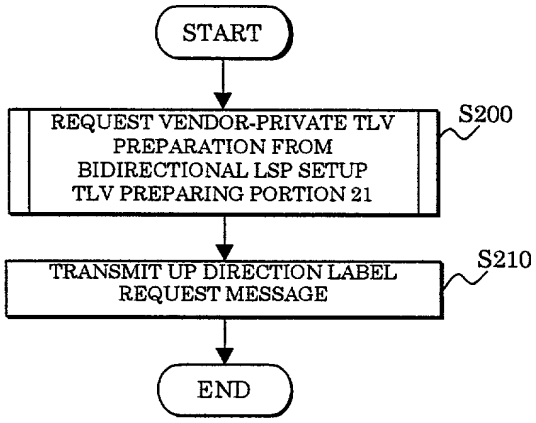

START
REQUEST VENDOR-PRIVATE TLV PREPARATION FROM BIDIRECTIONAL LSP SETUP TLV PREPARING PORTION 21
S200
TRANSMIT UP DIRECTION LABEL REQUEST MESSAGE
S210
END

FIG.6

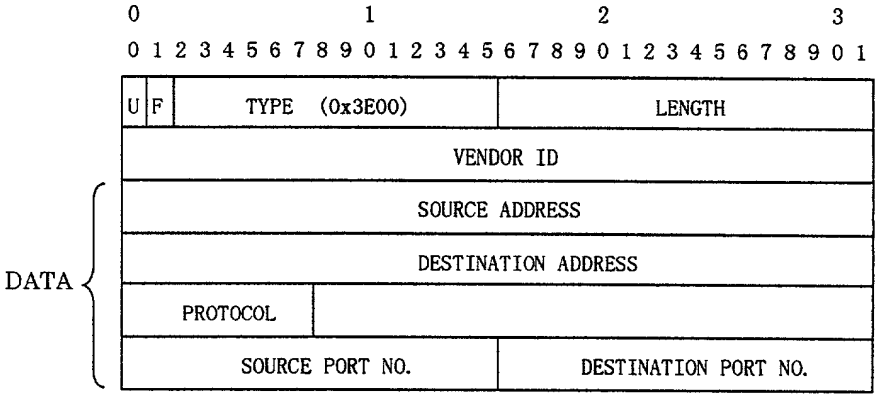
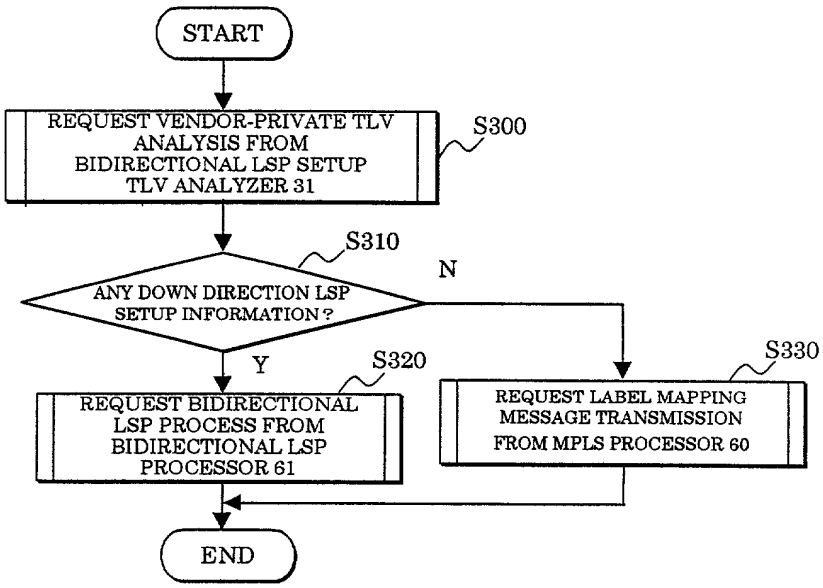
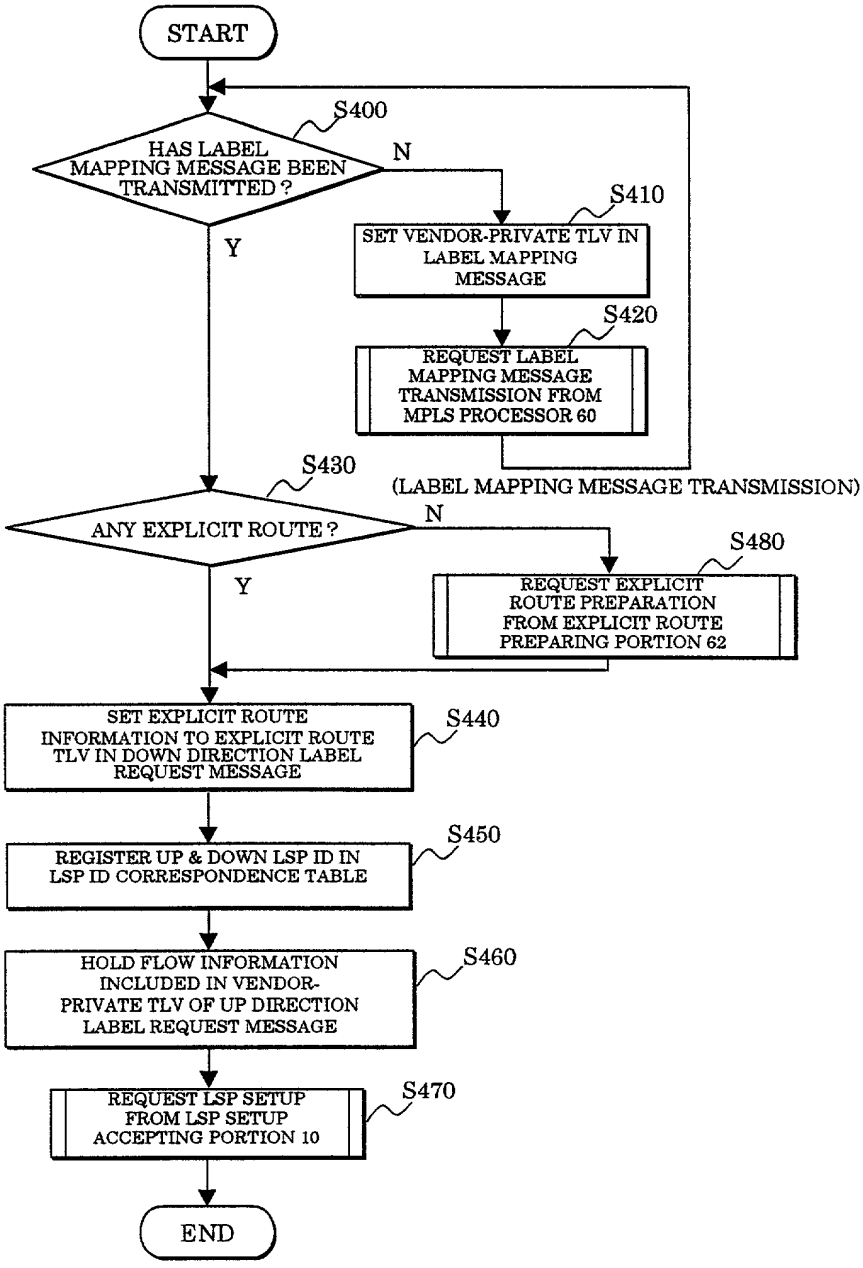

0 1 2 3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
U
F
TYPE (0x3E00)
LENGTH
VENDOR ID
DATA
SOURCE ADDRESS
DESTINATION ADDRESS
PROTOCOL
SOURCE PORT NO.
DESTINATION PORT NO.

FIG.7


START
REQUEST VENDOR-PRIVATE TLV ANALYSIS FROM BIDIRECTIONAL LSP SETUP TLV ANALYZER 31
S300
S310
ANY DOWN DIRECTION LSP SETUP INFORMATION ?
N
Y
S320
REQUEST BIDIRECTIONAL LSP PROCESS FROM BIDIRECTIONAL LSP PROCESSOR 61
S330
REQUEST LABEL MAPPING MESSAGE TRANSMISSION FROM MPLS PROCESSOR 60
END

FG72 (S)

FIG.8


START
S400
HAS LABEL MAPPING MESSAGE BEEN TRANSMITTED ?
N
Y
S410
SET VENDOR-PRIVATE TLV IN LABEL MAPPING MESSAGE
S420
REQUEST LABEL MAPPING MESSAGE TRANSMISSION FROM MPLS PROCESSOR 60
(LABEL MAPPING MESSAGE TRANSMISSION)
S430
ANY EXPLICIT ROUTE ?
N
Y
S480
REQUEST EXPLICIT ROUTE PREPARATION FROM EXPLICIT ROUTE PREPARING PORTION 62
SET EXPLICIT ROUTE INFORMATION TO EXPLICIT ROUTE TLV IN DOWN DIRECTION LABEL REQUEST MESSAGE
S440
REGISTER UP & DOWN LSP ID IN LSP ID CORRESPONDENCE TABLE
S450
HOLD FLOW INFORMATION INCLUDED IN VENDOR-PRIVATE TLV OF UP DIRECTION LABEL REQUEST MESSAGE
S460
REQUEST LSP SETUP FROM LSP SETUP ACCEPTING PORTION 10
S470
END

FG72 (6)

FIG.9

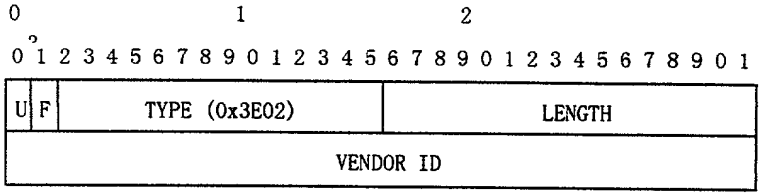


FIG.10

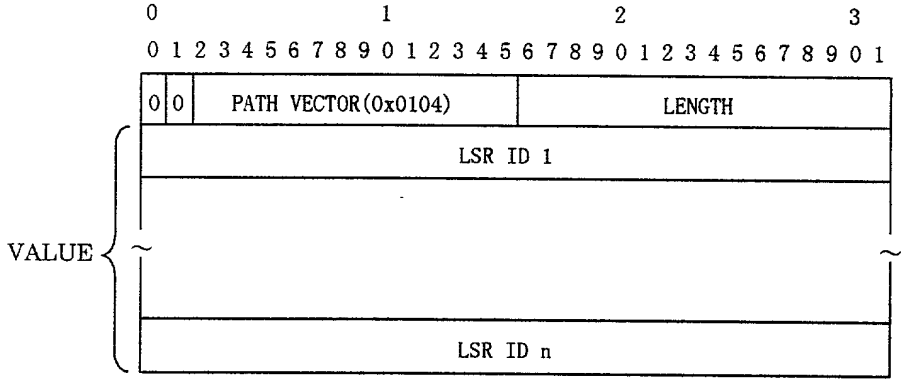


FIG.11

UP DIRECTION LSP ID	DOWN DIRECTION LSP ID
1	2

FG72 (7)

FIG.12

FIG.13

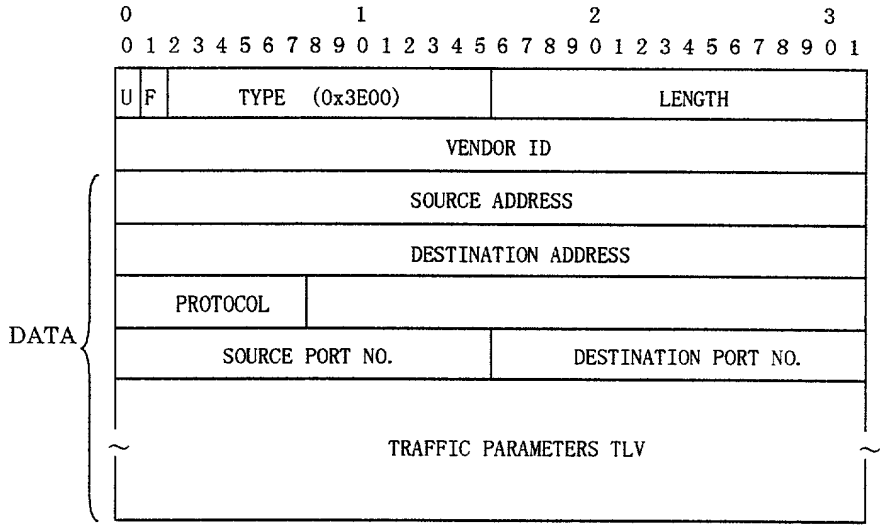


FIG.14

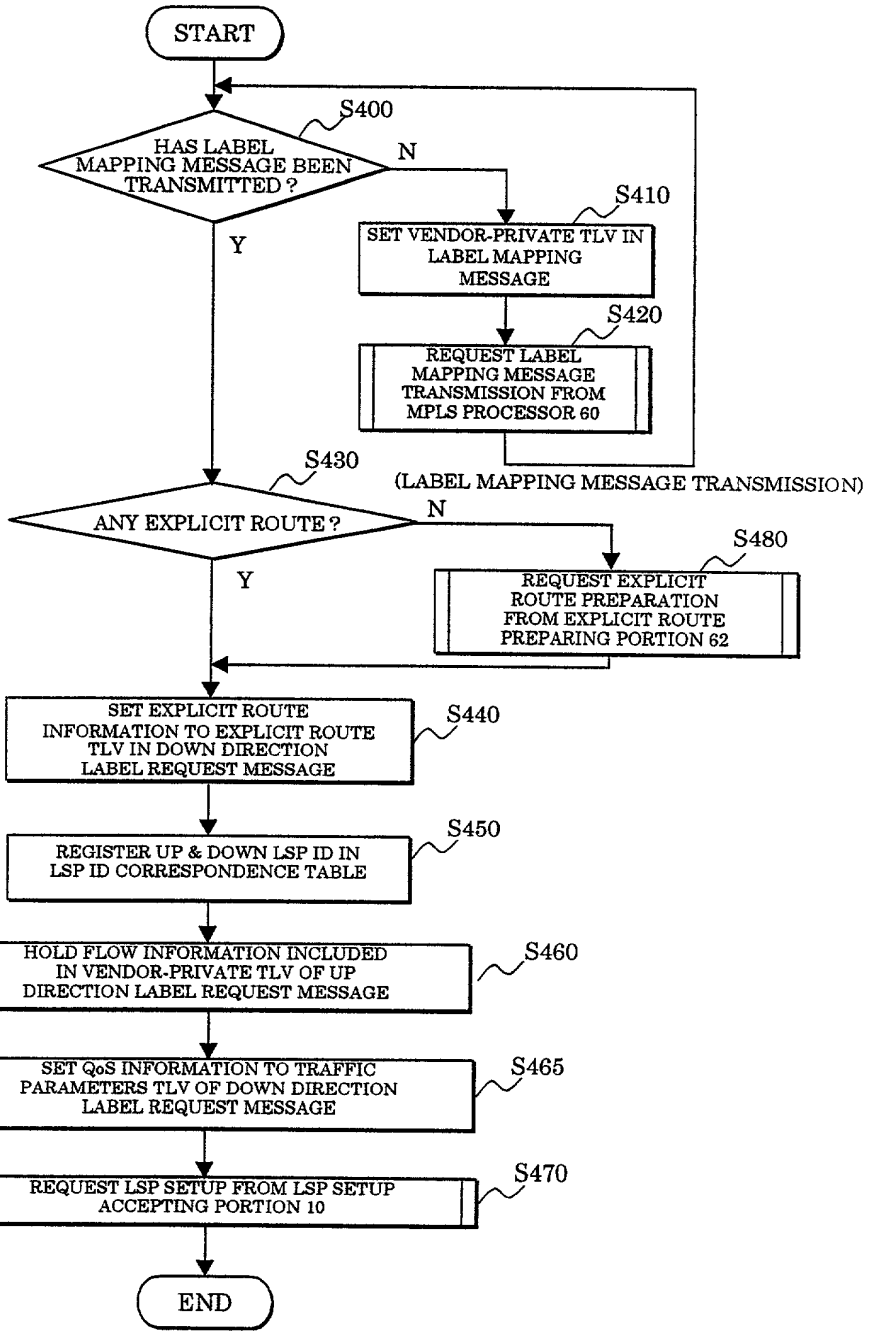


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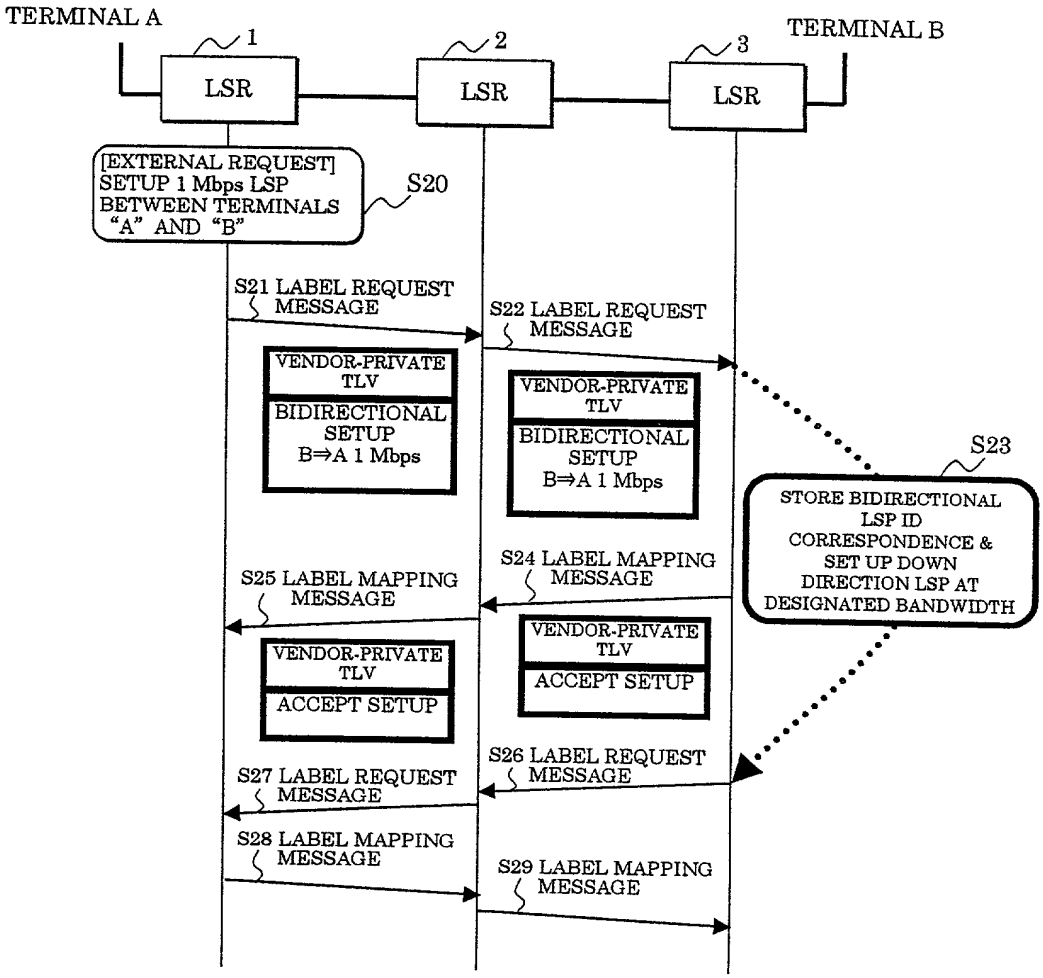
FIG.15


TERMINAL A
1
LSR
2
LSR
3
LSR
TERMINAL B
[EXTERNAL REQUEST]
SETUP 1 Mbps LSP
BETWEEN TERMINALS
"A" AND "B"
S20
S21 LABEL REQUEST
MESSAGE
S22 LABEL REQUEST
MESSAGE
VENDOR-PRIVATE
TLV
BIDIRECTIONAL
SETUP
B⇒A 1 Mbps
VENDOR-PRIVATE
TLV
BIDIRECTIONAL
SETUP
B⇒A 1 Mbps
S23
STORE BIDIRECTIONAL
LSP ID
CORRESPONDENCE &
SET UP DOWN
DIRECTION LSP AT
DESIGNATED BANDWIDTH
S24 LABEL MAPPING
MESSAGE
S25 LABEL MAPPING
MESSAGE
VENDOR-PRIVATE
TLV
ACCEPT SETUP
VENDOR-PRIVATE
TLV
ACCEPT SETUP
S26 LABEL REQUEST
MESSAGE
S27 LABEL REQUEST
MESSAGE
S28 LABEL MAPPING
MESSAGE
S29 LABEL MAPPING
MESSAGE

FG72 (10)

FIG.16

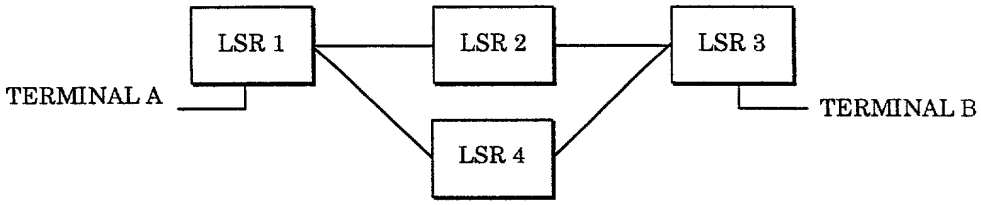
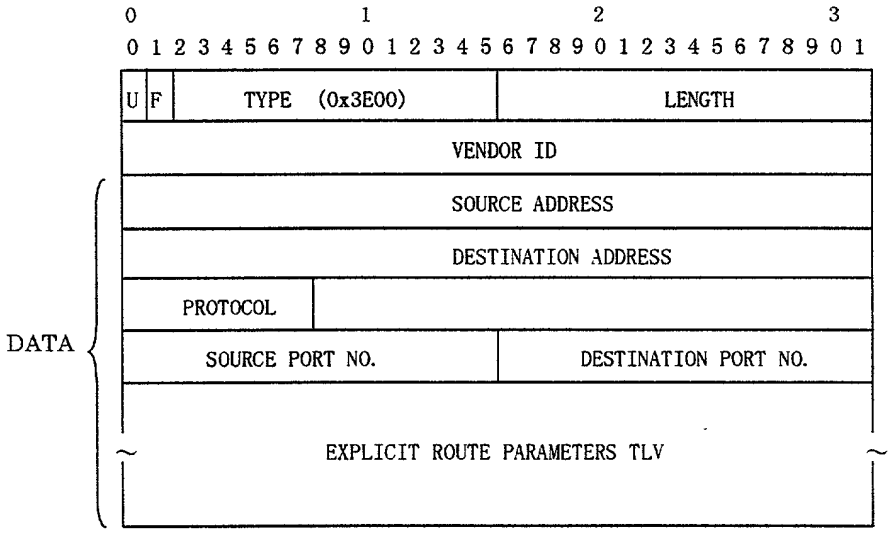


FIG.17



FG72 (11)

FIG.18

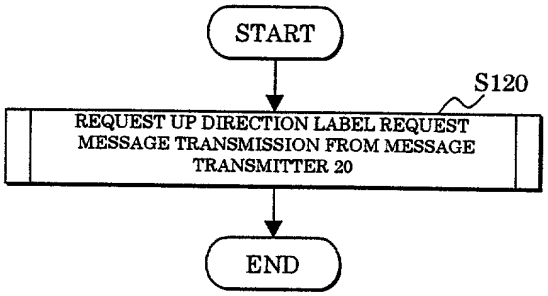


FIG.19

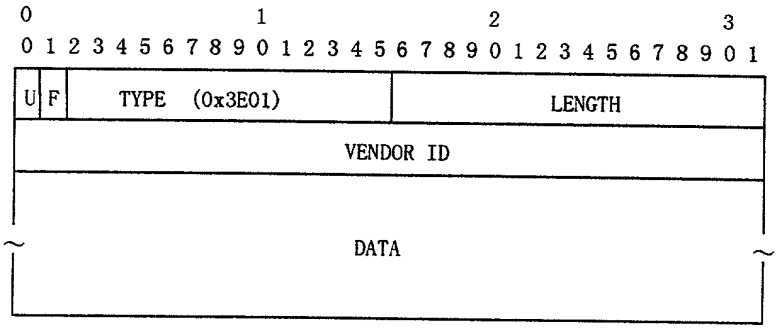


FIG.20

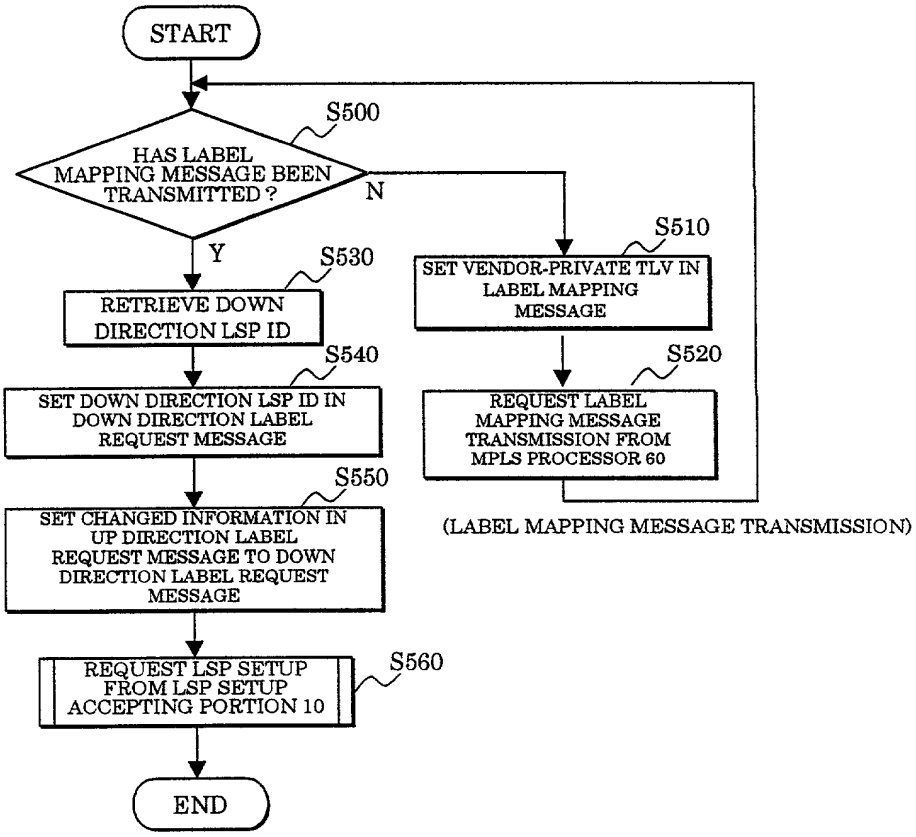

START
S500
HAS LABEL MAPPING MESSAGE BEEN TRANSMITTED ?
N
Y
S510
SET VENDOR-PRIVATE TLV IN LABEL MAPPING MESSAGE
S520
REQUEST LABEL MAPPING MESSAGE TRANSMISSION FROM MPLS PROCESSOR 60
(LABEL MAPPING MESSAGE TRANSMISSION)
S530
RETRIEVE DOWN DIRECTION LSP ID
S540
SET DOWN DIRECTION LSP ID IN DOWN DIRECTION LABEL REQUEST MESSAGE
S550
SET CHANGED INFORMATION IN UP DIRECTION LABEL REQUEST MESSAGE TO DOWN DIRECTION LABEL REQUEST MESSAGE
S560
REQUEST LSP SETUP FROM LSP SETUP ACCEPTING PORTION 10
END

FIG.21

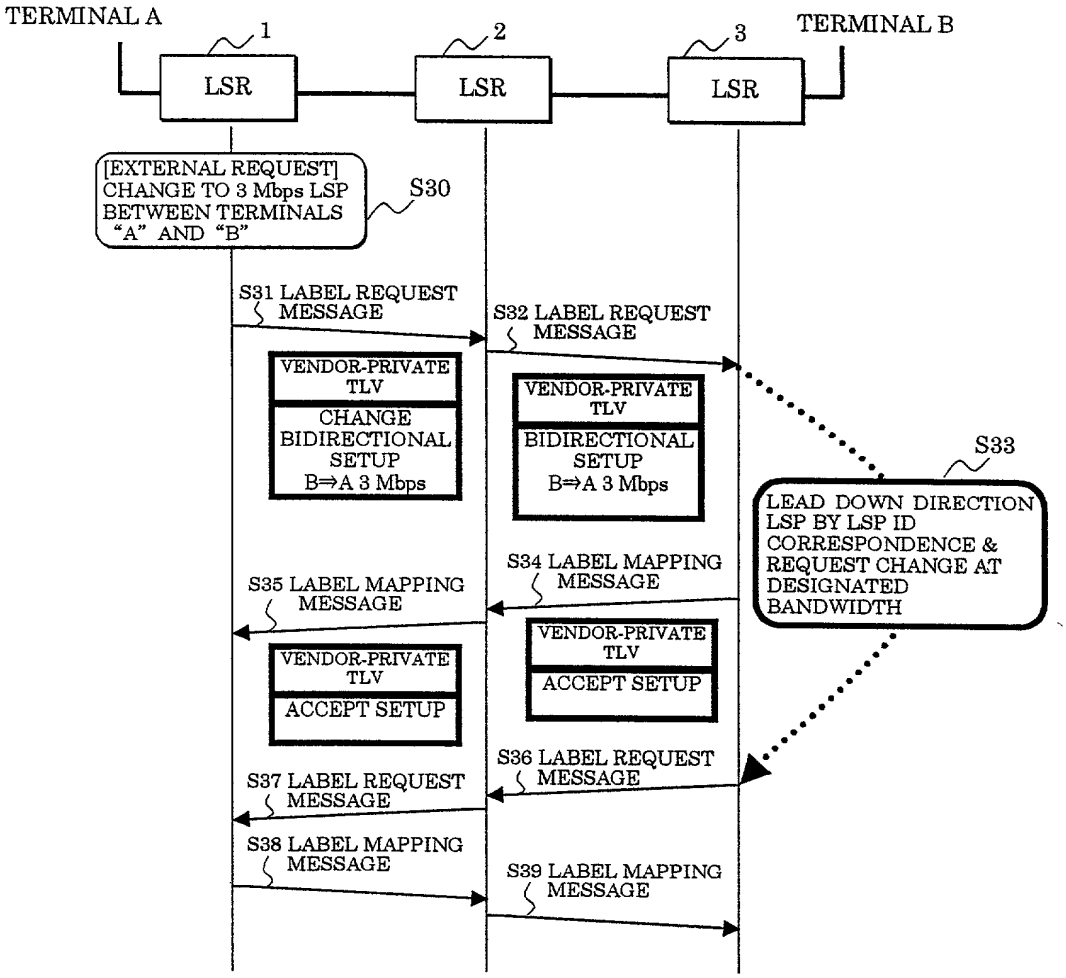


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FIG.22

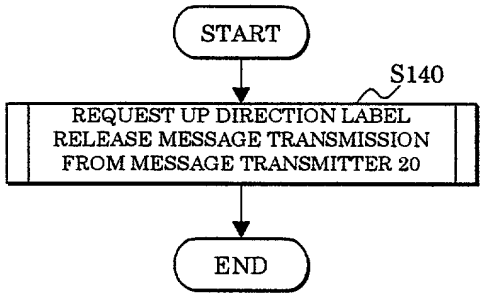


FIG.23

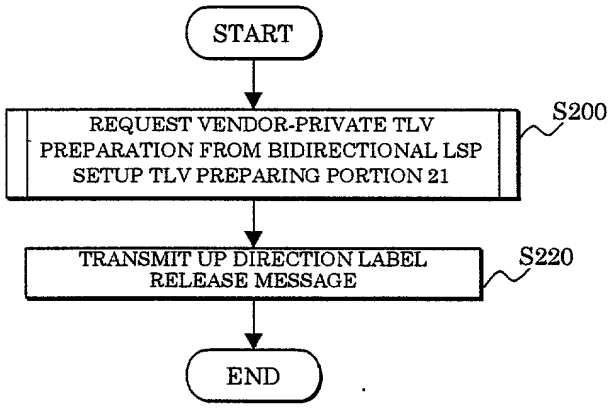


FIG.24

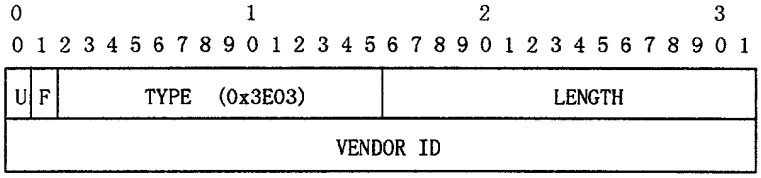


FIG.25

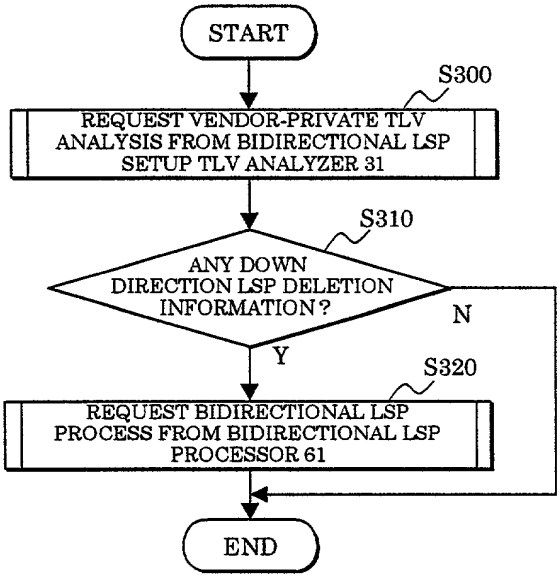
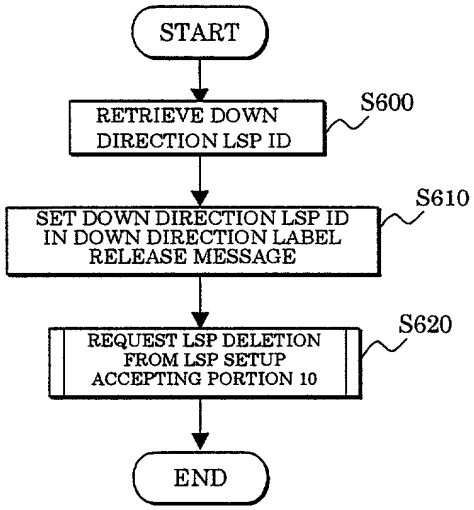

START
S300
REQUEST VENDOR-PRIVATE TLV ANALYSIS FROM BIDIRECTIONAL LSP SETUP TLV ANALYZER 31
S310
ANY DOWN DIRECTION LSP DELETION INFORMATION?
N
Y
S320
REQUEST BIDIRECTIONAL LSP PROCESS FROM BIDIRECTIONAL LSP PROCESSOR 61
END

FIG.26


START
RETRIEVE DOWN DIRECTION LSP ID
S600
SET DOWN DIRECTION LSP ID IN DOWN DIRECTION LABEL RELEASE MESSAGE
S610
REQUEST LSP DELETION FROM LSP SETUP ACCEPTING PORTION 10
S620
END

FG72 (6)

FIG.27

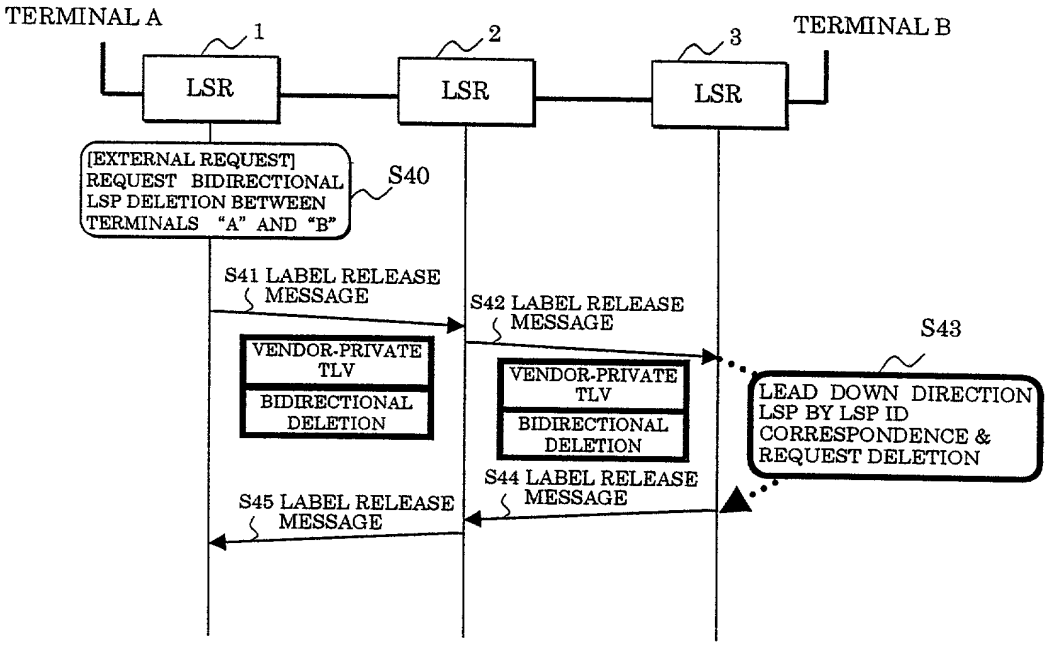

TERMINAL A
1
LSR
2
LSR
3
LSR
TERMINAL B
[EXTERNAL REQUEST]
REQUEST BIDIRECTIONAL
LSP DELETION BETWEEN
TERMINALS "A" AND "B"
S40
S41 LABEL RELEASE
MESSAGE
VENDOR-PRIVATE
TLV
BIDIRECTIONAL
DELETION
S42 LABEL RELEASE
MESSAGE
VENDOR-PRIVATE
TLV
BIDIRECTIONAL
DELETION
S43
LEAD DOWN DIRECTION
LSP BY LSP ID
CORRESPONDENCE &
REQUEST DELETION
S44 LABEL RELEASE
MESSAGE
S45 LABEL RELEASE
MESSAGE

FIG.28

PRIOR ART

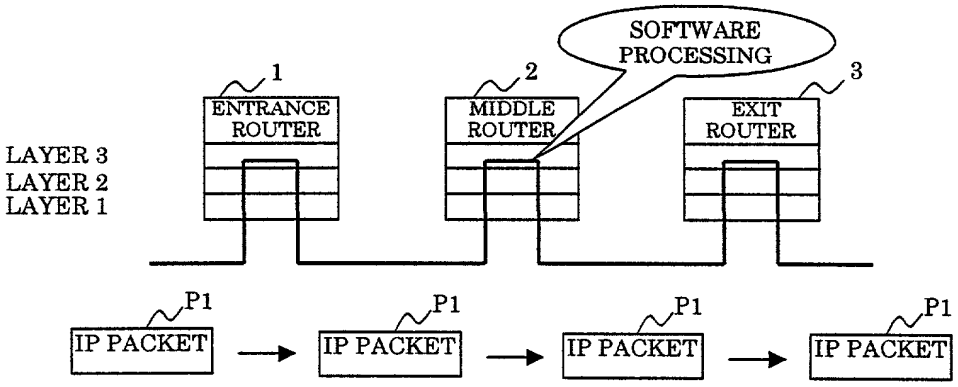


FIG.29

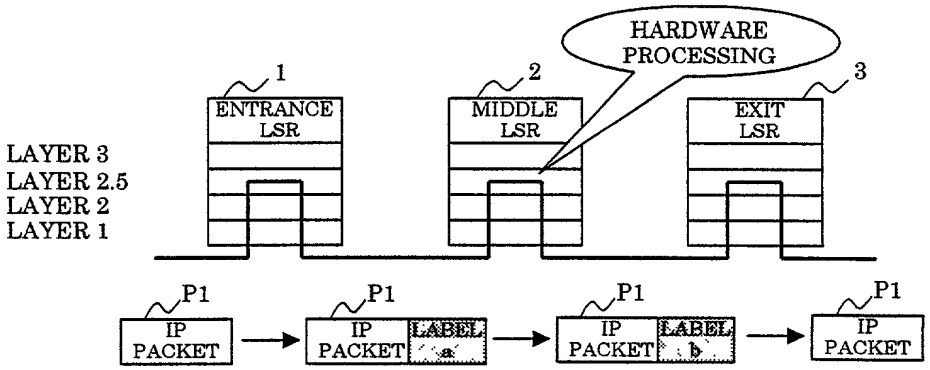


FIG.30

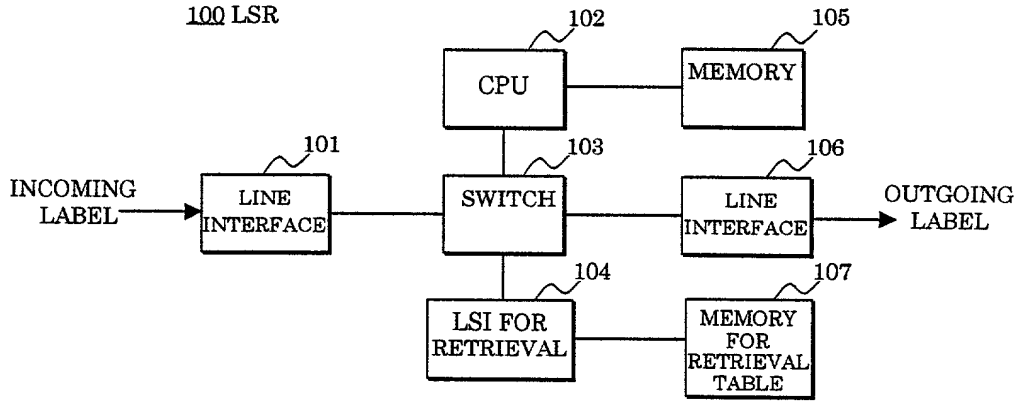
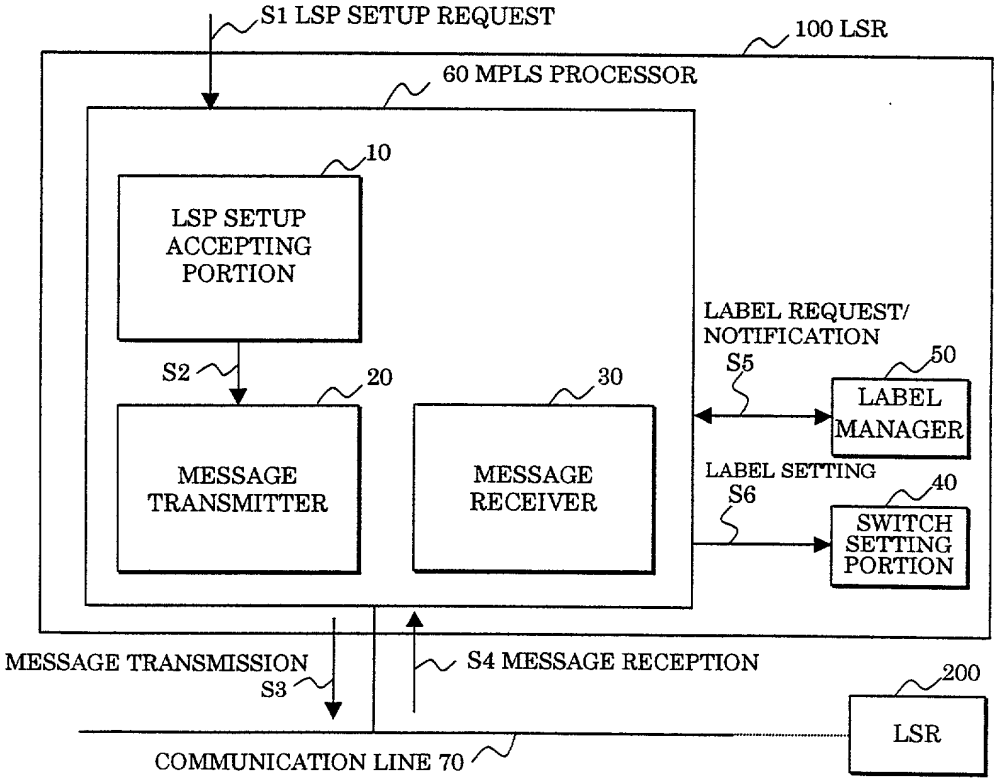


FIG.31

PRIOR ART



FG72 (17)止

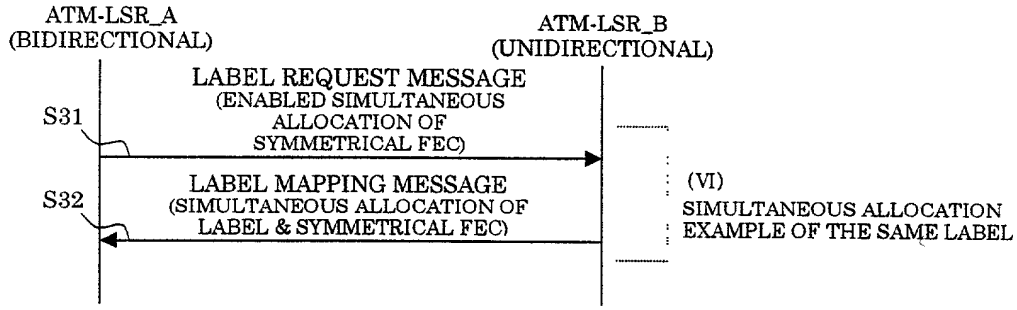



FIG.32